Human Presence Sensor

Manual Ver2.0

Model：SNR0502

Content

1. Summary

This manual provides the user with detailed technical information on the Human Body Infrared Sensor, including installation and programming details, and explains how to use the Human Presence Sensor based on practical examples, which are in-ceiling mounted;

There are many applications of human infrared sensors, which can detect small movements such as walking, body movement, head up, turning around, and breathing signals in normal work and life, and realize the detection of human existence in non-sleep state;

It is installed as a system with other devices via the EIB/KNX bus.

The entire system is set up and operated using the engineering design tool software ETS.

2. Product and feature overview

The human infrared sensor is mainly installed on the ceiling. It is a device that can sense external signals and physical conditions (such as light and movement), and transmit the sensed information to other devices (such as dimmers, relays) to achieve its Function. Connect to the EIB / KNX system through the EIB bus terminal block, and use the engineering design tool software ETS software (version ETS4.0 or later) to assign physical addresses and set parameters.
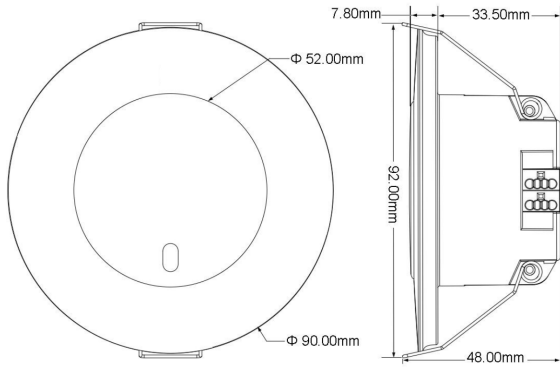
Function description:

(1) Illumination sensing function

(2) Micro-movement/movement detection function

(3) The sensitivity of the motion detection function can be adjusted

(4) Networking function with master-slave sensor control

(5) Illumination sensing function with 3 types of output data (data output type), the value of which can be sent cyclically

(6) Motion monitoring function with 3 types of output data, values can be sent cyclically

(7) With on/off indicator light function

(8) Valve (threshold) value (setting) function

(9) The function of prohibiting illumination and movement

3. Specification

Bus Voltage	21-30V DC
Bus Current	≤19mA
Bus power	≤570mW
Transmit power	≤0.5mW
Sensing distance	Installation height 2.5m~3m, radiation range 5m~7m
Installation Hole Size	φ55-65mm
Dimension	Height H=34mm, outer diameter R1=90mm, inner diameter R2=52mm
Installation way	Ceiling flush installation
Shell material	ABS
IP Grade	IP20
Weight (approx.)	About 0.1kg
Working temperature	-5°C- 45°C
Storage temperature	-25°C...+55°C
Transportation temperature	-25°C...+70°C

4. Dimensions, wiring diagrams and induction diagrams

Dimension

Wiring

7.80mm | 33.50mm

Φ 52.00mm

92.00mm

Φ 90.00mm

48.00mm

KNX总线输入

Induction schematic

3.0m

3.0m
4.0m

■ 移动 (速度 0.3m/s)

3.0m

3.0m
4.0m

■ 微动

3.0m

2.0m
3.0m

■ 呼吸
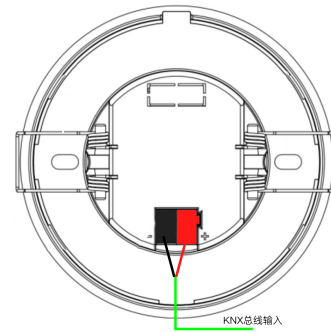
Installation height H: range size 2.5m~3m, recommended value: 3m

Moving range W1: 6m~8m,

Micro-movement range W2: 6m~8m,

Breathing detection range W3: 4m~6m,

5. Product operation and installation instructions
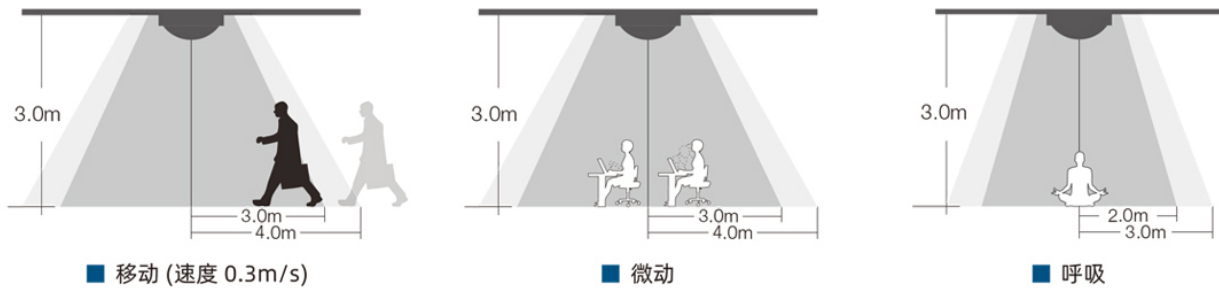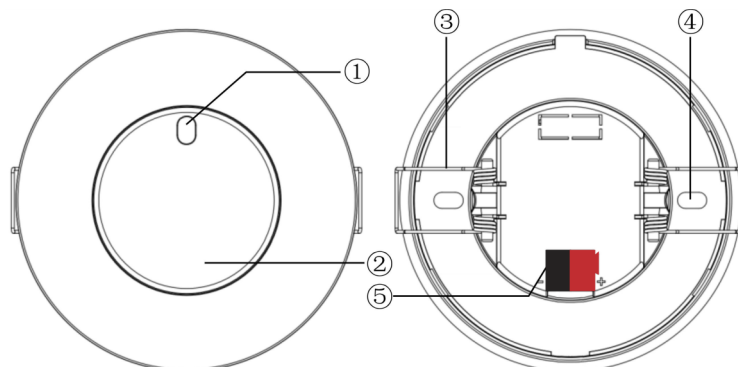
5.1 Product Operating Instructions

③   ④

①

②

⑤

① Illumination sensor and programming LED lights:

(1) The LED light flashes green: it indicates that the application layer of the device is working normally;

(2) LED light red: enter programming mode;

②Program button: short press this button, the programming LED turns red, that is, it enters the programming mode

③Installation torsion ring: for ceiling installation

④Screw fixing port: for embedded installation

⑤KNX bus connection terminal

5.2 Installation Precautions

1. Keep away from air conditioners, refrigerators, stoves and other places sensitive to air temperature changes;

2. In the case of a certain temperature, the influence of wind speed on the sensor is not very large;

3. When the ambient temperature is close to the human body temperature, the sensor response is not very sensitive, or even fails;

4. Furniture, large bonsai, glass, curtains and other objects must not be spaced between the sensor and the detected human body;

5. The sensor should not be directly on the doors and windows and places with direct sunlight (illumination and movement), otherwise the thermal disturbance outside the window and the movement of people will cause

False positives from sensors, and drastic changes in light can also cause false positives from sensors.

6. Parameter setting and communication object description

6.1 Overview of App Features

Illumination function

This function is mainly used for lighting, such as outdoor lighting. We often need to turn on the light when it is dark, and turn off the light when it is bright. The sensor can easily realize this operation process, and the sensor can automatically sense the current illuminance to achieve automatic Control, when it detects that the brightness in the room is the set limit value, it will pass the connected controller.

The optical device can complete the constant illuminance control function.

Mobile function

The movement function mainly implements the action when the sensor senses that someone is moving, and ends the action when no person is sensed for a period of time. For example, on a public aisle, you can set the sensor to automatically turn on the light when it senses someone walking, and automatically turn off the light after a delay after the person walks, so as to achieve the greatest energy saving effect. Can also be used in other fields.

Logical function

The logic function is to integrate the illumination and movement functions, and combine the illumination and movement functions. For example, to control home lighting, we want the light to turn on automatically as soon as we walk into the room, but we don't need to perform this action during the day, only at night, and when people leave or the sensor can't sense any movement, the light will turn on for a period of time. Automatic shutdown, the entire process of light control can be automatically completed by this logic function of the sensor.

Master-slave function

The master-slave function of a sensor is generally used in situations where multiple sensors control one or one type of equipment at the same time. When the main sensor receives the specified information from the sensor, it outputs the start value. After a delay for a period of time, if it does not receive the information from the sensor during this time, it outputs the end value. When this specified value is received, the delay restarts. For example, several sensors control a light at the same time. One of the slave sensors senses that someone has moved. At this time, the slave sensor sends a message. After the master sensor receives the specified message, it outputs a message and turns on the light. If the specified information is not received, the main sensor outputs a message again to turn off the light.

Prohibition of movement, illumination and logic functions

This function is convenient for some occasions and situations where it is necessary to disable illumination, movement, temperature, humidity or logic. When the illumination or movement of a sensor is prohibited, changes in illumination, movement, temperature and humidity will no longer affect this sensor. After the logic function is disabled, the sensor will no longer perform logic operations.

6.2 Function parameter setting

6.2.1 General

Open the human presence sensor parameter setting interface in ETS5, General This option is used for the basic settings of the human presence sensor, as shown in Figure 6.2.1
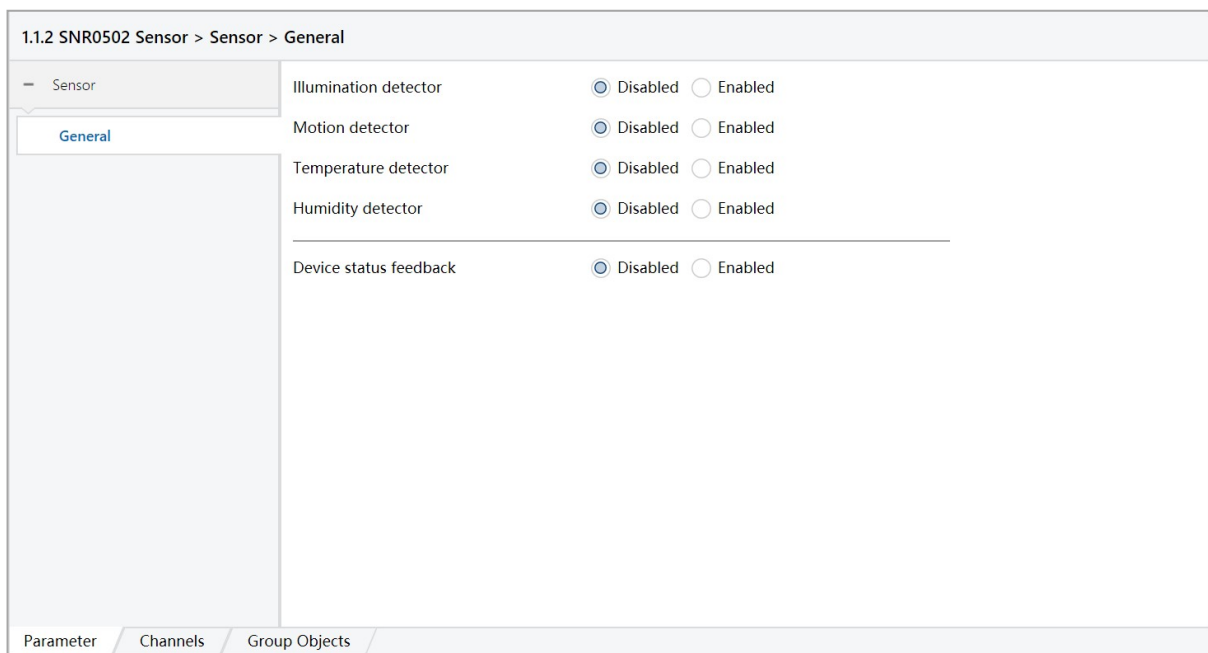
Figure 6.2.1

Specification	Description
Illumination detector	Indicates the illuminance sensor (optional: Disabled, Enabled)
Motion detector	Indicates a motion sensor (optional: Disabled, Enabled)
Temperature detector	Indicates a temperature sensor (temporarily unavailable)
Humidity detector	Indicates humidity sensor (temporarily unavailable)
Device status feedback	Device status feedback (optional: Disabled, Enabled)

6.2.2 Illumination detector

"Illumination detector"　The parameter setting interface is shown in Figure 6.2.2

1.1.2 SNR0502 Sensor > Sensor > Illumination detector

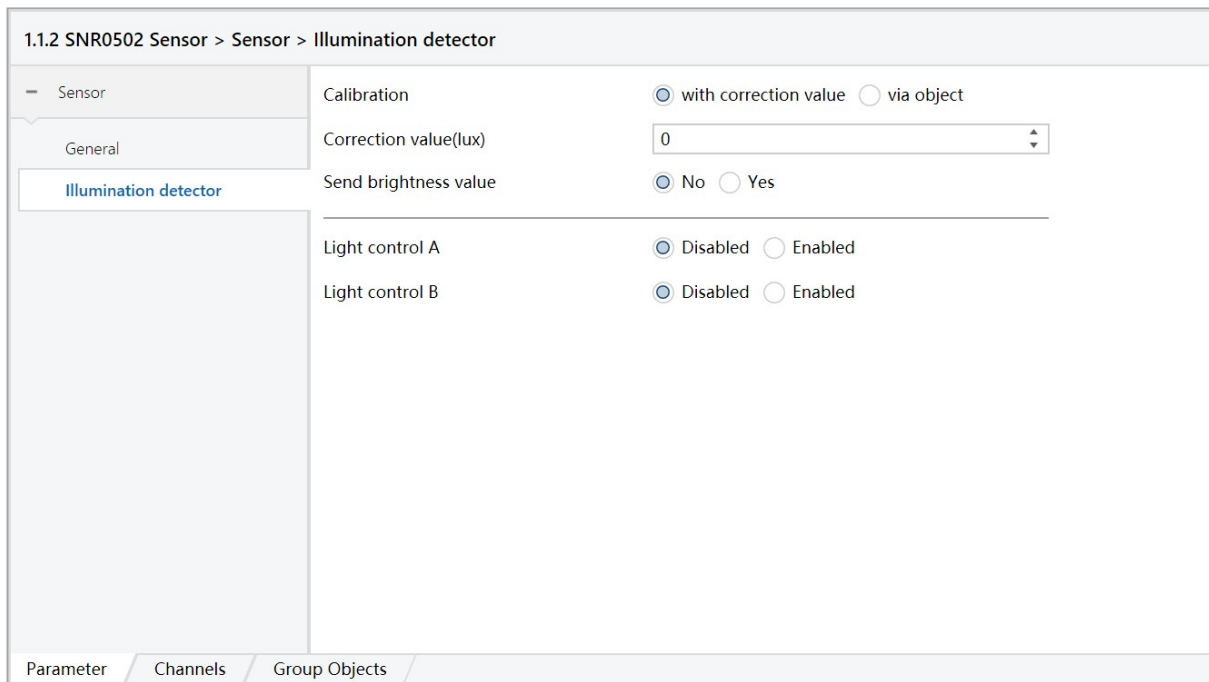| Sensor | Calibration | ⦿ with correction value ◯ via object |
General	Correction value(lux)	0
Illumination detector	Send brightness value	⦿ No ◯ Yes
	Light control A	⦿ Disabled ◯ Enabled
	Light control B	⦿ Disabled ◯ Enabled

Parameter　Channels　Group Objects

<div align="center">Figure 6.2.2</div>

Specification	Description
Calibration	This parameter is only used for the calibration of the brightness value when the brightness value is obtained from the inside, the options are: with correction value, via object. When with correction value is selected, the parameter correction value (lux) appears, and the range that can be filled is -200~200. For example: when the actual brightness value is 100lux, the detection value inside the sensor is 150lux. At this time, it needs to be in the VD library. Fill in the correction value -50lux, or correct by object -50lux.
Send brightness value	Use this parameter to determine whether to send the brightness value to the bus, the options are: "Yes" or "No". When selecting "Yes", the parameter "the mode for sending value" appears, and the options are: "transmit value in the event of changes", "transmit value in cycles". When "transmit value in the event of changes" is selected, the parameter "send brightness value on change" appears, the options are: change>=10lux, change>=25lux, change>=50lux, change>=75lux, change>=100lux); when "transmit value in cycles" is selected, the parameter "the time in cycles" appears, with options: 1 seconds, 2 seconds...120minutes.
Sending brightness value	This parameter is used to determine whether to send the internally detected illuminance value to the bus, options: "Yes" or "No". When "Yes" is selected, the parameter "the mode for sending value" appears, the options are: "transmit value in the event of changes", "transmit value in cycles". When "transmit value in the event of changes" is selected, the parameter "send brightness value on change" appears, the options are: "change>=10", "change>=25", "change>=50", "change> =75", "change>=100"); when "transmit value in cycles" is selected, the parameter "the time in cycles" appears, options 1seconds, 2seconds...120minutes
Light control A	Indicates light control channel A, options: "Enabled", "Disabled". When "Enabled" is selected, the interface will appear as shown in Figure 6.2.3

Light control B	Indicates light control channel B (same as Light control A)

Figure 6.2.3

Specification	Description
Blocking function	Block function, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "blocking value" will appear, options: "blocking=1, unblocking=0", "blocking=0, unblocking=1", blocking value after voltage recovery, options: "blocking", "unblocking", "as before voltage failure".
Threshold value（lux）	Indicates the threshold, optional: 0-1200.
Controlling condition	Control conditions, options: "higher than threshold value", lower than threshold value
Overwrite threshold value via object	This parameter is used to override the threshold by object, optional: "Yes", "No"
Source for brightness value	Source of illuminance value, optional: "internal value", "external value"
Brightness tolerance	Illuminance value tolerance, options: 10lux, 25lux, 50lux, 75lux, 100lux, 150lux, 200lux
1-bit output object	This parameter is used to output 1bit data, options are: "Enabled" to enable, "Disabled" to disable. When "Enabled" is selected, the parameter "1-bit value" appears, the options are "on", "off"
4-bit output object	This parameter is used to output 4-bit data, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "4-bit value" appears, the options are: "Decrease, Break", "Decrease 1%"…"Decrease 100%", "Increase, Break", "Increase 1%"… … "Increase 100%"
1-byte output object	This parameter is used to output 1byte data, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "1-byte type" appears, the options are: "scene number (1…64)", "percentage (0%…100%)", "unsigned value (0…255)")"; when "scene number (1…64)" is selected, the parameter "scene number" appears, and 1~64 can be filled; when "percentage (0%…100%)" is selected, the parameter "percentage" appears, Optional 0%~100%; when "unsigned value(0…255)" is selected, the parameter "unsigned value" appears, and 0~256 can be filled.

Delay time for output(s)	This parameter is used to determine the output delay time, which can be filled from 0 to 256.
Transmission mode for output	Output transmission mode, options: "one-time transmission", "cyclic transmission". When "cyclic transmission" is selected, the parameter "cyclic time for output" appears, the options are: "1seconds", "2seconds"..."120minutes".

6.2.3 Motion detector

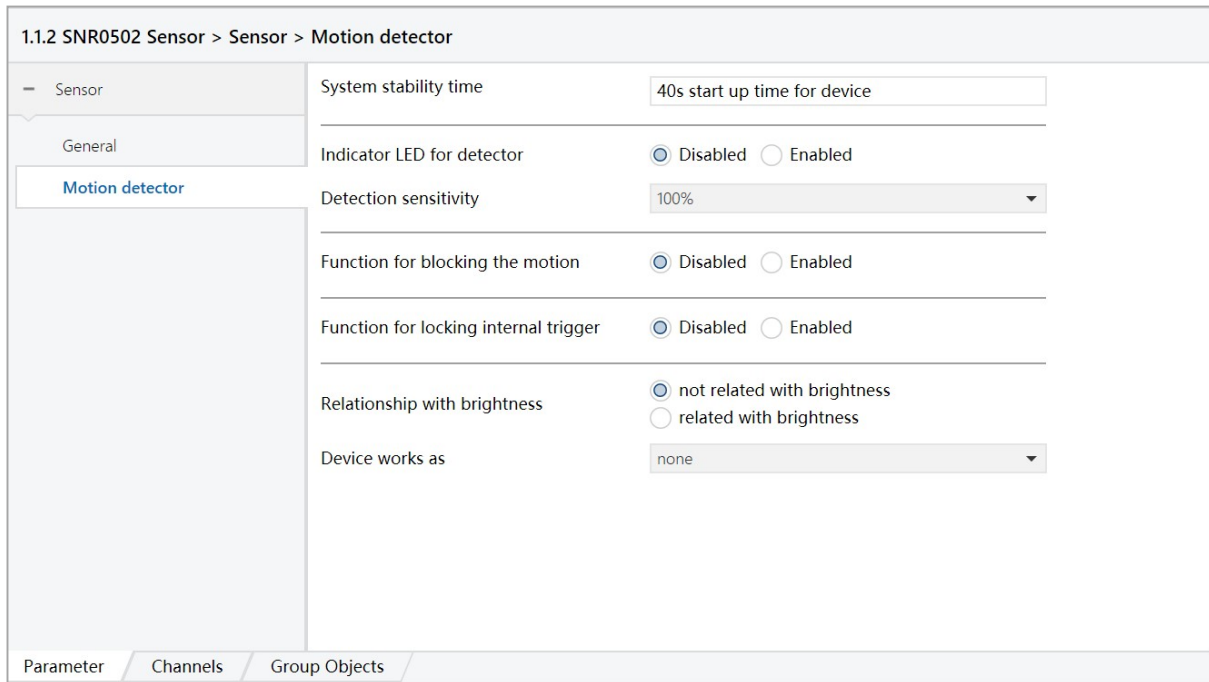"Motion detector"　The parameter setting interface is shown in Figure 6.2.4

Figure 6.2.4

Specification	Description
System stability time： 40s start up time for device	This parameter indicates that the device startup time is 40s
Indicator LED for detector	LED indicator detector, options: "Enabled", "Disabled"
Detection sensitivity	Sensitivity detection, optional: 0%, 1%...100%
Function for blocking the motion	Block the motion sensing function, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "blocking value" appears, options: "blocking=1, unblocking=0", "blocking=0, unblocking=1"), blocking value after voltage recovery, options: "blocking" , "unblocking", "as before voltage failure"
Function for locking internal trigger	Block the internal trigger function, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "locking value" appears, the options are: "locking=1, unlocking=0", "locking=0, unlocking=1"; locking value after voltage recovery, options: blocking", " unblocking", "as before voltage failure"
Relationship with brightness	This parameter is used to determine whether the control of motion sensing is related to the illumination. The options are: "Not related with brightness" (not related to illumination), "related with brightness", when "related with brightness" is selected, the parameter "threshold value" appears ", can fill in 0~1200, overwrite threshold value via object, options: "Yes", "No"; "source for brightness value", options: "internal value", "external value"

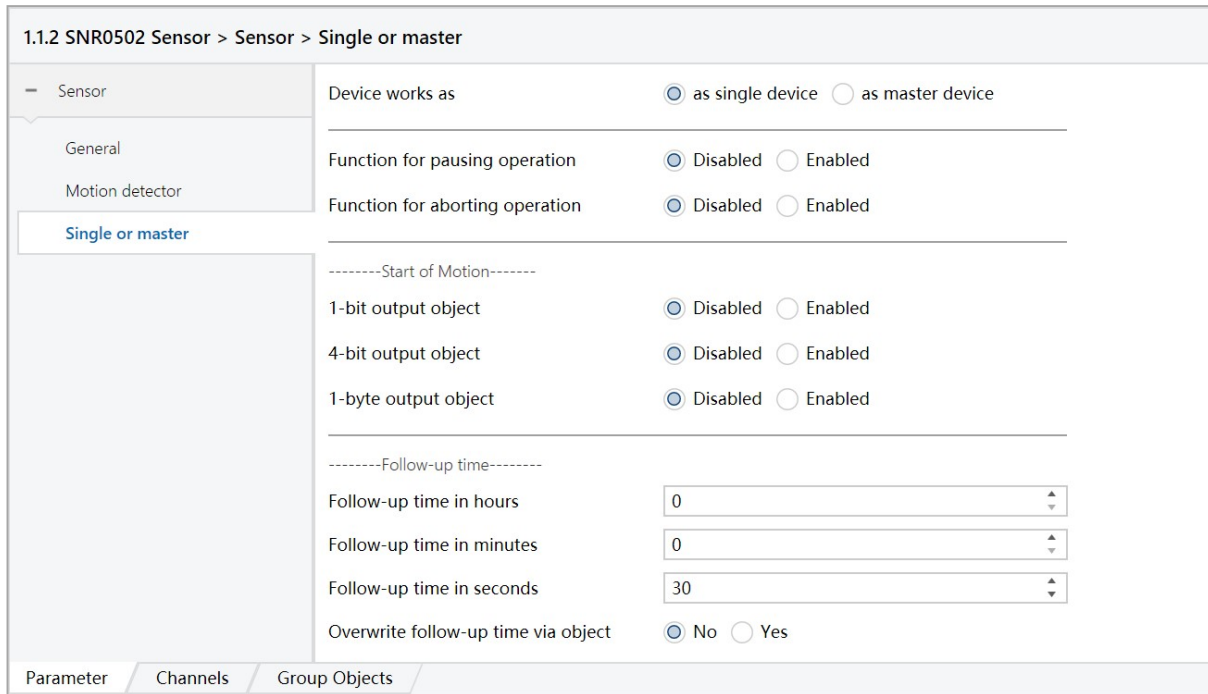| Device works as	This parameter indicates the working mode of the device, with options: "None", "single or master mode", "slave mode". When "single or master mode" is selected, the interface shown in Figure 6.2.5 will appear; when "slave mode" is selected, the interface will appear as shown in Figure 6.2.6

Figure 6.2.6

Specification		Description
Device works as		Device function mode, options: "as single device", "as master device". When "as master device" is selected, the parameter "input value as master" appears, with options "on" and "off".
Function for pausing operation		Pause operation function, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "for current operation" appears, the options are: "pause=0, continue=1", "pause=1, continue=0"
Function for aborting operation		This parameter is used to perform forced reset operation for motion sensing, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "for current operation" appears, the options are: "abort when receiving 0", "abort when receiving 1"
Start of motion	1-bit output object	This parameter is used to output 1bit data, options are: "Enabled", "Disabled". When "Enabled" is selected, the parameter "1-bit value" appears, the options are "on", "off".
	4-bit output object	This parameter is used to output 4-bit data, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "4-bit value" appears, the options are: "Decrease, Break", "Decrease 1%"…"Decrease 100%", "Increase, Break", "Increase 1%"… … "Increase 100%"
	1-byte output object	This parameter is used to output 1byte data, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "1-byte type" appears, the options are: "scene number (1…64)", "percentage (0%…100%)", "unsigned value (0…255))″ . When "scene number (1…64)" is selected, the parameter "scene number" appears, and 1~64 can be filled; when "percentage (0%…100%)" is selected, the parameter "percentage" appears, and 0 is optional. %~100%; when "unsigned value(0…255)" is selected, the parameter "unsigned value" appears, which can be filled with 0~256.

Follow-up time	Follow-up time in hours	Duration (in hours), you can fill in "0-23".
	Follow-up time in minutes	Duration (in minutes), you can fill in "0-59".
	Follow-up time in seconds	Duration (in seconds), you can fill in "0-59".
	Overwrite follow-up time via object	Override duration by object, optional: "Yes", "No".
	Motion trigger during follow-up time	This parameter is used to set whether to recalculate the duration when the motion sensor is re-triggered. Options are: "recalculate follow-up time when trigger", "Not recalculate follow-up time when trigger".
End of motion	1-bit output object	This parameter is used to output 1-bit data, options: "Enabled", "Disabled", when "Enabled" is selected, the parameter "1-bit value" appears, options: "on", "off"
	4-bit output object	This parameter is used to output 4-bit data, options: "Enabled", "Disabled", when "Enabled" is selected, the parameter "4-bit value" appears, options: "Decrease, Break", "Decrease 1% "..."Decrease 100%", "Increase, Break", "Increase 1%"..."Increase 100%".
	1-byte output object	This parameter is used to output 1byte data, options: "Enabled", "Disabled". When "Enabled" is selected, the parameter "1-byte type" appears, the options are: "scene number (1...64)", "percentage (0%...100%)", "unsigned value (0...255)")"; when "scene number (1...64)" is selected, the parameter "scene number" appears, and 1~64 can be filled; when "percentage (0%...100%)" is selected, the parameter "percentage" appears, Optional 0%~100%; when "unsigned value(0...255)" is selected, the parameter "unsigned value" appears, and 0~256 can be filled.
Dead time after end of motion(s)		This parameter is used for the sensor to sense no one for a period of time. After sending the execution action to the bus, the sensor does not perform any operation after a certain period of time. You can fill in "0-255".

1.1.2 SNR0502 Sensor > Sensor > Motion, Slave output

Sensor	
General	
Motion detector	
Motion, Slave output	

Output value as slave	○ Off ● On
Dead time after triggering(s)	5

Parameter / Channels / Group Objects

Figure 6.2.6

Specification	Description
Output value as slave	Output value as slave device (options: "on", "off")
Dead time after triggering (s)	This parameter is used to perform no operation after a certain period of time after the slave sensor is triggered (can be filled with "0-255")

6.2.4 Temperature detector (temporarily unavailable)

6.2.5 Humidity detector (temporarily unavailable)
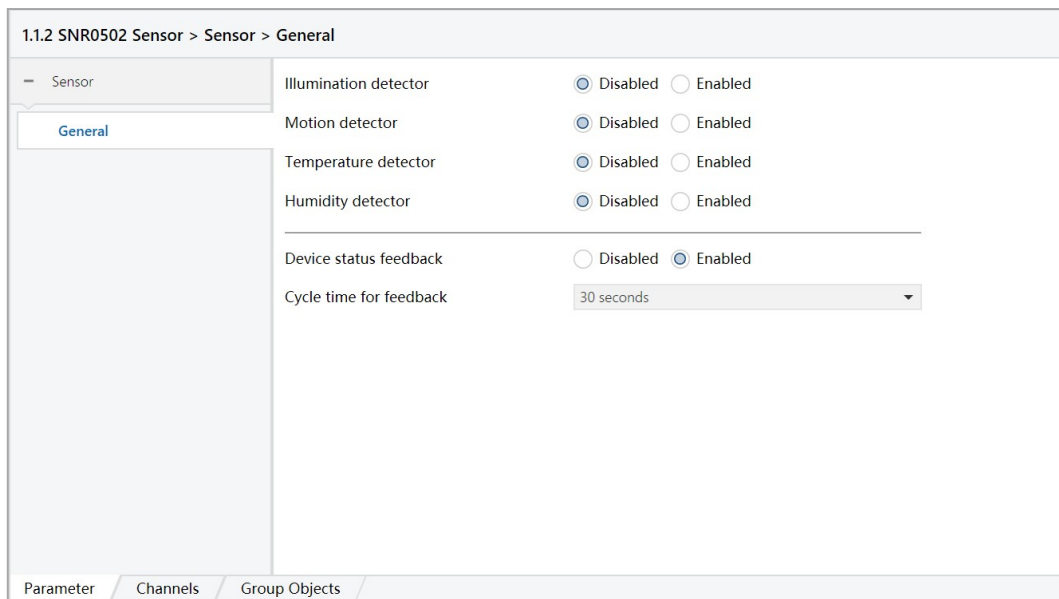
6.2.6 Device status feedback

Figure 6.2.7

This parameter is used for device status feedback, options: "Enabled", "Disabled"; when "Enabled" is selected, the parameter "cycle time for feedback" appears), options: "1 seconds", "2 seconds"… …"120 minutes".

7. Description of communication objects

The communication object is the medium through which the device communicates with other devices on the bus, that is, only the communication object can communicate on the bus. The function of each communication object is described in detail below.

The human presence sensor has a total of 57 objects. Note: "C" in the property column of the form below represents the communication function enable of the communication object, "W" indicates that the value of the communication object can be rewritten through the bus, and "R" represents the communication object's value. The value can be read through the bus, "T" means that the communication object has a transmission function, and "U" means that the value of the communication object can be updated.

7.1 Illumination function communication object

Figure 7.1

No	Name	Communication object function	Data	Attributes
0	Brightness value (calibration)	(-L...+L)	2 bytes	C, R, W, T
This communication object is enabled when "via object" is selected in the parameter "calibration", and the current ambient brightness value can be calibrated through this communication object.				
1	Brightness value (output)	Value in lux	2 bytes	C, R, W, T
This communication object is enabled when the parameter "send brightness value" selects "Yes", and this communication object can directly indicate the current ambient brightness value.				
2,8	Light control block A/B	Block/unblock	1bit	C, R, W, T
This communication object is enabled when the parameter "Blocking function" in "light control A/B" selects "Enabled". Sending a 1-bit command through this communication object can block any operation of the illumination sensor on the channel.				
3,9	Overwrite light threshold	Value in lux	2 bytes	C, R, W, T
This communication object is enabled when the parameter "overwrite threshold value via object" in "light control A/B" is selected as "Yes", and a 2-byte command can be sent through this communication object to perform the illumination threshold of the corresponding channel. rewrite.				
4,10	External brightness value A/B (input)	Value in lux	2 bytes	C, R, W, T
This communication object is enabled when the parameter "source for brightness value" in "light control A/B" selects "external value". Through this communication object, the 2-byte brightness value input by other devices can be received.				
5，11	Light control 1-bit output A/B	On/Off	1 bit	C, R, W, T
The communication object is enabled when the parameter "1-bit output object" in "light control A/B" selects "Enabled". Sending a 1-bit command through this communication object can control the on/off of other devices.				
6，12	Light control 4-bit output A/B	4-bit value	4 bits	C, R, W, T
The communication object is enabled when the parameter "4-bit output object" in "light control A/B" selects "Enabled". Sending a 4-bit command through this communication object can control the increase or decrease of dimming.				
7,13	Light control 1-byte output	1-byte value	1 byte	C, R, W, T

	A/B			

This communication object is enabled when the parameter "1-byte output object" in "light control A/B" selects "Enabled". Sending a 1-byte command through this communication object can control the scene, output percentage, etc.

7.2 Mobile sensing function communication object

序号 ▲	名称	对象功能	描述
14	Motion control block	block/unblock	
15	Motion sensor trigger lock	lock/unlock	
16	Motion, Overwrite light threshold	value in lux	
17	Motion, External brightness value (input)	value in lux	
18	Motion, Master input	On/Off	
19	Start of motion, 1-bit output	On/Off	
20	Start of motion, 4-bit output	4-bit value	

序号 ▲	名称	对象功能	描述
14	Motion control block	block/unblock	
15	Motion sensor trigger lock	lock/unlock	

Figure 7.2

No	Name	Communication object function	Data	Attributes
14	Motion control block	Block/unblock	1bit	C, R, W, T
The communication object is enabled when the parameter "function for blocking the motion" selects "Enabled". Sending the "0"/"1" command through this communication object can block or cancel any operation of the motion sensing on the channel.				
15	Motion sensor trigger lock	lock/unlock	1 bit	C, R, W, T
This communication object is enabled when "Enabled" is selected in the parameter "function for locking internal trigger". Sending "0"/"1" commands through this communication object can block or unblock the internal trigger function of motion sensing.				
16	Motion，Overwrite light threshold	Value in lux	2 bytes	C, R, W, T
This communication object is enabled when the parameter "overwrite threshold value via object" is selected as "Yes". Sending a 2-byte command through this communication object can rewrite the illumination threshold of the corresponding channel.				
17	Motion，External brightness value（input)	Value in lux	2 bytes	C, R, W, T
This communication object is enabled when the parameter "source for brightness value" selects "external value", through which the 2-byte brightness value input by other devices can be received.				
18	Motion，Master input	On/Off	1 bit	C, R, W, T
This communication object is enabled when the parameter "device work as" in "single or master" selects "as master device", through which the data input from the slave device can be received.				

19, 23	Start/End of motion, 1-bit output	On/Off	1 bit	C, R, W, T
This communication object is enabled when the parameter "1-bit output object" of "start/end of motion" in "single or master" selects "Enabled". Sending a 1-bit command through this communication object can control other devices on/off.
20,24	Start/End of motion, 4-bit output	4-bit value	4bits	C, R, W, T
This communication object is enabled when the parameter "4-bit output object" of "start/end of motion" in "single or master" selects "Enabled". Send a 4-bit command through this communication object to control dimming increase or decrease.
21,25	Start/End of motion, 1-byte output	1-byte value	1 byte	C, R, W, T
The communication object is enabled when the parameter "1-byte output object" of "start/end of motion" in "single or master" selects "Enabled". Sending a 1-byte command through this communication object can control the scene , output percentage, etc.
22	Motion, Overwrite follow-up time	In seconds	2 bytes	C, R, W, T
This communication object is enabled when "Yes" is selected in the parameter "Overwrite follow-up time via object" of "follow-up time" in "single or master". Sending a 2-byte command through this communication object can reset the Write the duration.
26	Motion control pause	Pause/continue	1 bit	C, R, W, T
This communication object is enabled when "Enabled" is selected for the parameter "function for pausing operation" in "single or master", and the normal operation of the sensor can be paused and resumed by sending the value "0"/"1" through this communication object.
27	Motion control abort	On/Off	1 bit	C, R, W, T
This communication object is enabled when the parameter "function for aborting operation" in "single or master" selects "Enabled", and the sensor status can be cleared by sending the value "0"/"1" through this communication object。
28	Motion, slave output	On/Off	1 bit	C, R, W, T
This communication object is enabled when "slave mode" is selected in the parameter "device work as", and outputs "0"/"1" to the host device through this communication object.

7.3 Communication object of temperature function (temporarily unavailable)
7.4 Humidity function communication object (temporarily unavailable)

7.5 Device status feedback

Figure 7.5

No	Name	Communication object function	Data	Attributes
57	Device status	1-byte value	1byte	C, R, W, T
This communication object is enabled when "Enabled" is selected in the parameter "device status feedback", and this communication object can directly indicate the current status of the device.

8. Safe use and maintenance

(1) Read all instructions carefully before use.

(2 to establish a good ventilation environment.

(3) During use, pay attention to moisture-proof, shock-proof and dust-proof.

(4) It is strictly forbidden to be exposed to rain, contact with other liquids or corrosive gases.

(5) If it is wet or invaded by liquid, it should be dried in time.

(6) When the machine fails, please contact professional maintenance personnel or our company.

9. Contact

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